

Official Interpretation No. 50-98

DATE: January 28, 1999

SUBJECT: Height and Area Requirements for Type 5B, One and Two-Family Dwellings as Defined by the Sixth Edition of the Code

Background:

A one- or two-family dwelling designed and constructed as an R-4 Use in accordance with the provisions of Chapter 36 of the Sixth Edition of the Code is typically built of Type 5B Construction. Chapter 36 does not define a one- or two- family structure in terms of its construction type. Referencing the definition section of this chapter, we learn only the number of lodgers and/or boarders legally allowed to occupy each dwelling, but do not learn much about the structure itself. However, the materials generally employed in one- and two-family dwelling construction most closely resemble those used in a Type 5B building as defined in Chapter 6 of the base code.

Also, Chapter 36 does not provide guidance in respect to the maximum size of a one-or two-family dwelling in terms of its height above grade (number of stories, and dimensional height) or in terms of its square foot area per floor.

Question: Absent this information, how does one determine the maximum size of a one and two-family dwelling building (both in terms of stories above grade and maximum square foot area per floor) if it is designed and constructed as an R-4 Use according to the provisions of Chapter 36?

Answer: Since Chapter 36 does not provide the answers we seek, we must first turn to Chapter 3, Section 310.6 which defines an R-4 structure as a “*detached one- or two-family dwelling(s) not more than **three stories** in height, and (its) accessory structures.*” This section states further that “*All such structures shall be designed in accordance with 780 CMR 36 (Chapter 36 of the Sixth Edition) or in accordance with the requirements of 780 CMR (this code) applicable to Use Group R-3*”.

This section provides the code user with two distinct options for the design and construction of R-4 structures (detached one or two family dwellings and their accessory structures). Option 1; design in accordance with Chapter 36. Option 2; design in accordance with the requirements applicable to R-3 structures.

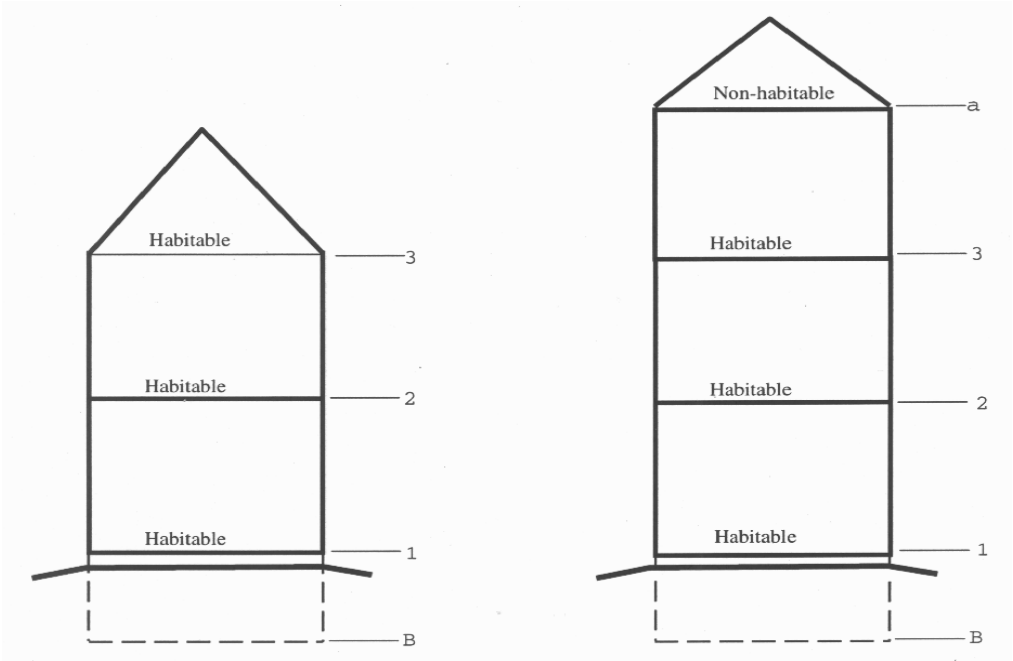
Question: Does this mean that such buildings may be designed and constructed with habitable floors **three stories** above the exterior grade plane?

Answer: Yes. However, one must assure that all applicable code requirements are satisfied for all inhabited floors including the upper-most floor (i.e.: light, ventilation, means of egress requirements, etc.).

At times, depending upon the configuration of the exterior grade, it may be difficult to determine the number of stories above which a building projects. Therefore, we have provided examples of buildings correctly configured under this definition. (See Figures 1a and 1b).

Figure 1a.

Figure 1b.



Note: Figures 1a and 1b illustrate typical gable roof, single family dwellings. Figure 1a depicts a dwelling consisting of three floors of habitable space and a basement. Figure 1b shows a dwelling consisting of three floors of habitable space, a basement and attic space above the third floor. Assuming requirements set by local zoning ordinances are met, each structure as depicted satisfies building code requirements in terms of its allowable number of stories above grade. However, be cautioned that the attic area shown in Figure 1b shall only be used as storage (**not habitable or occupiable**) space.

Question: Figure 1b illustrates a structure with attic space as the upper-most level. How does one distinguish habitable space from attic space?

Answer: *Habitable space* is defined in Chapter 2 of the code as “space in a structure for living, sleeping, eating, or cooking. Bathrooms, toilets compartments, closets, halls, storage or utility space and similar areas are not considered habitable space”. *Attic* is defined in Chapter 12 as “the space between the ceiling beams of the top story and the roof rafters”.

Attic space may only be provided if it does not constitute an additional story (i.e.: the head height and other conditions of this area do not allow for human occupancy. **Remember that by definition, the structure may only be three stories in height above the exterior grade plane.**

Question: Since bathrooms are not considered habitable space, is it permissible to locate a bathroom in this attic level?

Answer: No. The upper-most level, as illustrated in Figure 1b, is intended to be used as **storage** or **utility** space only and is limited by one or more construction features which fall short of that required for habitable or occupiable space (i.e.: ceiling height measures less than seven (7) feet, structural members will support only loads that are less than that required for habitable space, or room dimensions measure less than required, etc.).

Question: What about an existing, two story home with attic space; may it be converted into a three story structure with each floor made habitable?

Answer: Again, the key to this question is, does the attic comply with **all** applicable sections of Chapter 36 for habitable spaces (i.e.: design loads, light, ventilation, means of egress, etc.). If the answer is yes, then the structure may be converted. If portions of the third story do not satisfy code requirements (i.e.: the access stair is too narrow or rise and run dimensions are not satisfactory) the building official must reject the permit application. However, an applicant may seek relief through administrative appeal procedures (the Building Code Appeals Board) as defined in Chapter 1, Section 126, or offer compliance alternatives as defined in Chapter 34 of the code.

Question: Is a walk-out basement defined as a story above grade, and is it considered to contribute to the height of the building?

Answer: Chapter 5, Section 502.1 defines a story above grade as “Any story having its finished floor surface entirely above grade except that a basement shall be considered as a story above grade where the finished surface of the floor above the basement is:

1. More than six feet (1829mm) above [the] grade plane;
2. More than six feet (1829 mm) above the finished ground level for more than 50% of the total building perimeter, or
3. More than 12 feet (3658mm) above the finished ground level at any point”.

As demonstrated by the definition above, the answer to this question is dependent upon exterior grade conditions; which makes sense. The code limits the number of stories above grade which a building may be constructed as a direct function of an occupant’s ability to exit the building in the event of an emergency. The higher up in the building one resides, the farther one must travel to exit the building. In a fire condition, the code is concerned with smoke conditions in open stairwells and other factors that may limit one’s ability to escape from a building. Consequently, a walk-out basement (or any basement meeting a part of the definition identified above) may very well contribute to the height of the building above grade, if it is constructed according to one of the methods defined above.

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Figures 2a through 2c illustrate conditions where a basement contributes to the number of stories above grade.

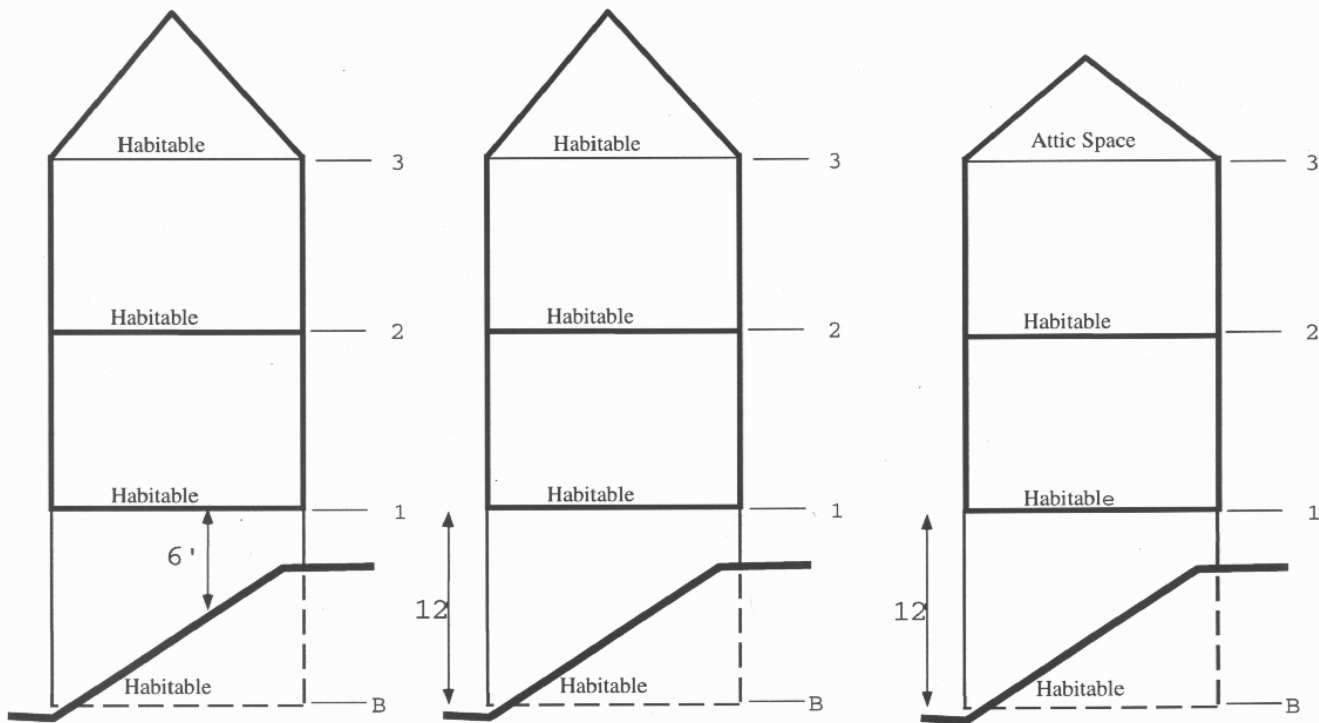


Figure 2a.

Figure 2b.

Figure 2c.

Note: Both Figures 2a and 2b depict a single family dwelling which is **four stories** above grade (in reference to the definition for story above grade). Since the definition of an R-4 limits the building to **three stories** in height, these buildings (Figures 2a and 2b), erected of Type 5B construction, would be in violation of building code provisions. However, as is illustrated in Figure 2c, if the upper-most floor is designed and used as an attic (as defined in 780 CMR 202), it shall not be considered an additional story).

Question: To this point, only the height of the building has been addressed. What about the maximum area per floor for an R-4 structure?

Answer: Unlike the number of stories above grade, the code is silent on the issue of floor area for these structures. Essentially, the area is unlimited. This is not to imply that the code is not concerned with the size of the building in terms of its area, and that additional safeguards should not be considered in the design and construction of very large R-4 structures. However, these safeguards are built into the code in that very large buildings will be afforded additional smoke detection (see Chapter 36, Section 3603.16) and large structures are generally designed with egress capacity well in excess of what the code would normally require; usually with many exterior decks and balconies providing additional means of egress and/or routes of escape from the building.

Question: At the start of this interpretation, it was mentioned that Section 310.6 affords the code user two options when designing and building R-4 structures. We spoke of Chapter 36 requirements, but what about the option of designing the building as an R-3 using code provisions applicable to that use group?

Answer: It is clear that the code allows one to utilize this option. In doing so, however, one must recognize that different code requirements apply. Why? The Sixth Edition of 780 CMR is based on two separate national model codes; the 1993 BOCA National Building Code and the 1995 CABO One and Two Family Dwelling Code. As one might expect, uniting these two codes into a single document (as was done with the Sixth Edition of the Massachusetts State Code) sometimes results in conflicts between the two texts. The subject matter this interpretation illustrates one of these conflicts.

In explanation, R-3 structures are typically designed as multiple, single family, attached units (what are commonly referred to as row houses). Because these units are adjoined, the code is more concerned with conflagration and other safety issues, and therefore restricts the design of these structures more rigorously than it does for detached one and two-family dwellings.

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We know that Chapter 36 is silent on height and area limitations for one and two family structures. Reviewing code provisions relative to R-3 structures, we find that 780 CMR Chapter 5, Table 503 defines height and area limitations for the R-3 Use Group Classification, but does not include reference to detached one and two-family buildings, as does the 1993 BOCA National Code. This reference was purposely deleted in the Massachusetts code to illustrate that the intended height limitations for detached one and two-family dwellings is to be three stories above grade as defined herein (and 780 CMR 310.6).